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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/717,487	11/21/2003	Tokihiro Nishihara	025720-00017	7624

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ARENT FOX KINTNER PLOTKIN & KAHN, PLLC  
Suite 400  
1050 Connecticut Avenue, N.W.  
Washington, DC 20036-5339

EXAMINER

SUMMONS, BARBARA

ART UNIT	PAPER NUMBER
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2817

DATE MAILED: 02/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/717,487

Applicant(s)

NISHIHARA ET AL.

Examiner

Barbara Summons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 11/17/2005 (amend) & 12/08/2005 (RCE).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1, 2, 5-13, 15, 17, 19 and 20 is/are allowed.
- 6) ☒ Claim(s) 3, 4, 14, 16 and 18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/17/05 has been entered.

### ***Claim Objections***

2. Claim 20 is objected to because of the following informalities:

Applicant indicated in the response received 11/17/05 (see page 10, first paragraph), that claim 20 had been amended to correct the informalities. However, the pivotal word "more" has been omitted, therefore:

in claim 20, on line 5, note that "including" should be followed by - - more - -  
(see also paragraph 2 of the prior Office action).

Appropriate correction is required.

### ***Maintained Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 3 is rejected under 35 U.S.C. § 102(b) as being anticipated by Lakin U.S. 5,942,958 (of record).

Figs. 3A and 3B of Lakin disclose the invention as discussed in paragraph 4 of the prior Office action. Regarding the newly added feature of claim 3 that “the parallel-arm resonator at the first stage on the signal input side connected directly to an input terminal of the filter”, Lakin specifically discloses embodiments that are not shown that have a parallel/shunt resonator directly connected to the input terminal of the filter (see col. 5, lines 32-40). For example, removing both the initial series resonators X31 and X39 of Lakin still leaves a symmetrical ladder filter with the parallel-arm X32 directly connected to the input terminal and composed of two parallel connected one port resonators X32A and X32B connected between the input terminal node and ground.

***Maintained Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 4 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Shibata et al. U.S. 6,556,103 (of record) in view of Tikka et al. U.S. 6,741,145 (of record) for reasons of record substantially repeated below.

As discussed in paragraph 6 of the prior Office action, Figs. 33, 35 and 37 of Shibata disclose a ladder filter formed with thin film resonators (TFRs) wherein each of all the series arm resonators and parallel arm resonators in Fig. 37 are replaced with two TFRs connected in parallel as shown in Figs. 33 and 35 (see col. 15, lines 3-5).

However, Shibata while showing that the two resonators connected in parallel share a common piezoelectric layer (see e.g. Shibata's claim 19 and Fig. 35), does not explicitly show that all of the resonators in the ladder filter of Fig. 37 share the piezoelectric layer.

Tikka discloses that forming TFRs with a patterned piezoelectric layer (Fig. 13a) or an unpatterned piezoelectric layer (Fig. 13b) are art recognized alternatives.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the filter element of Shibata US '103 (Figs. 33, 35 and 37), if even necessary, such that all of series and parallel arm resonators would have had a common piezoelectric thin film layer, because Shibata US '103 is silent as to the formation of the piezoelectric layer for the ladder filter of Fig. 37, thereby suggesting to one of ordinary skill that any well known method of forming the piezoelectric layer, including not patterning it and using vias for connections, as

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suggested by Tikka '145 (Fig. 13b), would have been usable therewith, and because even if the piezoelectric layer of Shibata US '103 were patterned, forming it common to all of the resonators by not patterning it, would have been merely an art recognized alternative as suggested by Tikka '145 (see Fig. 13a vs. Fig. 13b).

7. Claims 14, 16 and 18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Lakin U.S. 5,942,958 (of record) in view of Bradley et al. U.S. 6,262,637 (of record) for reasons of record substantially repeated below.

Lakin discloses a filter element having every claimed feature, including a parallel-arm resonator at the first stage directly connected to an input terminal (see col. 5, lines 32-40) as discussed above.

However, Lakin does not explicitly disclose the filter for use as a transmitting/receiving filter in a radio frequency (RF) high frequency circuit duplexer with amplifiers.

Bradley et al. discloses that it would have been extremely well known in the art to provide thin film piezoelectric resonator filters as the transmitting and receiving filters in duplexers utilizing a power amplifier in the transmitting branch and a low noise amplifier in the receiving branch (see Fig. 1).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the filter of Lakin by having provided it as a transmitting filter of a RF high frequency duplexer with amplifiers, because such an obvious modification would have been merely an extremely well known intended use of

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such thin film piezoelectric filters as suggested by the exemplary teaching thereof by Bradley et al. (see Fig. 1).

***Allowable Subject Matter***

8. Claims 1, 2, 5-13, 15, 17, 19 and 20 are allowable over the prior art of record.

***Response to Arguments***

9. Applicants' arguments, filed 11/17/05, with respect to claims 1, 12, 13, 15 and 17 have been fully considered and are persuasive, since it is agreed that the prior art does not show "at least one of the parallel-arm resonators being composed of only one single-terminal pair piezoelectric thin-film resonator". The rejections of these independent claims and those claims dependent therefrom have been withdrawn.

10. The remainder of Applicants' arguments filed on 11/17/05 have been fully considered but they are deemed not persuasive.

Regarding claim 3 and Lakin, Applicants argue that Lakin does not show a parallel-arm resonator directly connected to the input terminal (see the first paragraph on page 11 of the amendment). This argument is not persuasive because Lakin clearly does disclose an alternate embodiment, not shown in the figures, of its symmetrical filter having a parallel-arm resonator directly connected to the input terminal (see col. 5, lines 32-40), wherein removing series resonators X31 and X39 would provide such a symmetrical filter.

Regarding the Shibata US reference, Applicants only argue that Shibata does not show “at least one of the parallel-arm resonators being composed of only one... resonator” (see page 13, the first full paragraph of the amendment), but does not argue the recited feature of claim 4. The Examiner agrees Shibata does not show the claim 1 feature and has withdrawn this rejection. However, the Examiner maintains that the combination of Shibata/Tikka discloses every claimed feature of claim 4 since Shibata shows every resonator of the ladder filter being replaced with two parallel connected resonators, and Tikka provides the suggestion to form all resonators of a filter on a single unpatterned piezoelectric layer as discussed above in the rejection. The motivation to combine the references being the silence of Shibata as to the formation of the piezoelectric layer (i.e. it inherently must be patterned or unpatterned) and the teaching of Tikka that either a patterned or unpatterned piezoelectric layer is an art recognized equivalent of the other. The Office action does not “restate the advantages of the present invention to justify the combination of references” as asserted by Applicants (see page 14, the last four lines of the first full paragraph). Since Applicants made no specific arguments regarding the Shibata/Tikka combination and the features of claim 4, no further response is considered necessary at this time.

Regarding claims 14, 16 and 18, Applicants argue that because the Lakin reference does not show the “parallel-arm resonator at the first stage on the signal input side connected directly to an input terminal...” then the combination of Lakin/Bradley does not show every feature of the invention (see pg. 17 of the amend.). This argument is not persuasive because Lakin does disclose this feature (col. 5, lines 32-40).



11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barbara Summons whose telephone number is (571) 272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

bs  
February 6, 2006

  
**BARBARA SUMMONS**  
**PRIMARY EXAMINER**